

Educator's Barriers to Using Technology

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the Requirements for the Degree of Master of Science in Educational Administration

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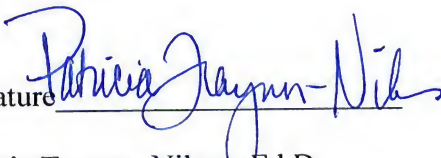
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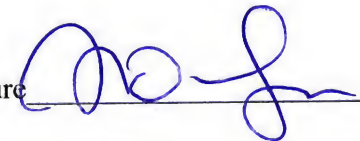
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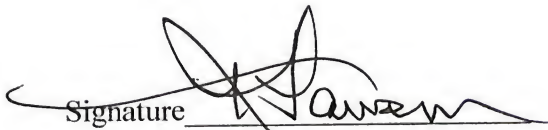
We certify that we have read this action research project of April Brown entitled *Educator's Barriers to Using Technology* and that, in our opinion, it is satisfactory in the scope and quality of an action research project for the degree of Master of Science in Education Administration in the School of Education, National University.

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Abstract

The study is an action research project focused on learning more about the barriers to using technology at one site in Southern California. Learning about the barriers for one school may assist this researcher in learning how to improve the chances of teachers and staff using technology in the field of education.

The methodology of this study was to understand the site and day-to-day operations of one site through participant observation, survey, and inventory methods as well as informal interviews of staff. A survey was provided to staff using the Likert Scale as well as open ended questions for the staff to fill in with their comments.

The study revealed staff perceived several barriers to using technology in the classroom. The majority of the staff perceived themselves as being proficient in the use of technology inside and outside the classroom. The barriers that staff perceived are related to equipment failure and malfunction. Another assumption that was made from this study is that further training on school site software programs Scantron and Oasis should be delivered to the staff. Open ended survey responses supported the overall survey findings as well as observations made on campus.

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Chapter One

Introduction

The importance of using technology in the classroom and integrating technology in the classroom is a central issue in education. Preparing students for using technology in real world applications may actually blossom first in the classroom. Each year thousands of educators attend the International Society of Technology in Education (ISTE) to highlight how technology is used in the classroom, new technology, and meet other educators interested in using technology. Grants are issued to schools for the purchase of new technology and ways of incorporating technology into the field of education. All this effort to incorporate technology to enrich the lives of our students and to help better prepare them for the workplace, and yet there is still a lack of technology in the classroom.

Background and State of the Problem

The benefits of using technology embedded within the curriculum are highlighted in one study (Lennex, 2008). Lennex (2008) examined the use of video iPods for middle school aged students in which one of the conclusions stated that students would pay more attention if iPods were used in the classroom and plenty of equipment for small group use. (p. 4914). This study discussed the benefits of using technology and the student motivation from using a technology that was shared among a small group of students.

Purpose

The purpose of the proposed action research project was to find reasons why technology is not being used in the classroom at one school site in Southern California. The research site is a K-12 Southern California Charter School that recently moved into a new location from a much smaller space. The school has approximately 700 students whose parents have selected this

school and live within and without the city limits. All the students are driven to school from as far away as 30 minutes travel time.

As a site, using technology is challenging. Technology resources and equipment were sparse and the equipment was either broken or promised to another staff member. These were challenges that impede on the integration of technology and successful use of technology in the curriculum. This study attempted to understand the barriers that staff faced when implementing technology.

Research Questions

This study focused on three questions. The research questions outlined in this study are:

1. What are the barriers to using technology?
2. Is staff proficient in technology?
3. Does the staff desire to use more technology in their classes?

Context of the Action Research Study

This study focused on one public school site in Southern California that serves K – 12 grades with a student body of approximately 700 students. The school serves a diverse ability student population who are driven to campus from a large surrounding area. This school is a parent choice school, which means that parents are opted to send their children to this campus by choice over the traditional public school in their neighborhoods. The community is primarily Caucasian, English speaking, and middle class families.

This study served as a document to evaluate the technology needs at this campus and to determine the areas of improvement staff perceive.

Definition of Terms

Oasis

Oasis. Oasis is a database that functions as an online cumulative file with areas for comment insertion as well as grades, IEP, and other information.

School-Level Barriers

School-Level Barriers Bingimlas (2009) first identified this categorization of barriers.

The school-level barriers are: lack of time, lack of effective training, lack of accessibility, and lack of technical support.

Scantron

Scantron. Computer-based assessment provided by an independent organization that includes standard-based evaluation of the student.

Survey

Survey The survey conducted in this study used the Likert Scale in a series of items for the staff member to answer as they perceive their own proficiencies in technology.

Teacher-Driven Barriers

Teacher-Driven Barriers Also referred to as institutional barriers. Bingimlas (2009) first identified this categorization of barriers. They are further defined as the teacher-level level barriers are: lack of teacher confidence, lack of teacher competence, and resistance to change and negative attitudes.

Technology

Technology In this study is defined as the use of computers, digital media, ELMOs, and other equipment that helps to support computer use, internet, or other media (TV, VCR, and DVD). The technology focus for this study was computers, desktop or laptops, and

internet accessibility. However, staff answered questions about a variety of software and hardware technologies that they may be familiar with and would likely use in the classroom or for support in their teaching efforts.

Summary

In this study, the barriers to using technology at one school site in Southern California was examined and whether staff perceived the lack of technology as a problem. Examination of the barriers for educators revealed some insight into whether the barrier was teacher-driven or administration-driven. A teacher-driven barrier was their inability to integrate technology into the classroom whereas the administrative-driven barrier was how the administration views the use of technology in the classroom as well as view of the value of technology use. Evaluation of this issue uncovers how to approach technology use on this school site while attempting to provide additional resources to staff.

In the next chapter, this paper highlights literature on this topic as well as the current needs of students in the area of technology.

Chapter Two

Review of Literature

Utilizing technology for use in the classroom is beneficial for a variety of reasons as discussed in this chapter. A review of the literature discusses barriers other researchers have uncovered. Literature highlighting the use of technology in the classroom and the benefits for using technology is discussed in the following.

Theoretical Framework

Utilizing technology in the classroom is beneficial to student achievement and performance. What are the barriers to using technology? Is staff proficient in technology? Does the staff desire to use more technology in their classes?

This study was designed referencing the studies by Bingimlas (2009) and Patter (2009) using an approach of categorizing barriers into two categories: 1) teacher-driven and 2) school-driven. Once understanding how the barrier exists within one of these categories, the solution or a possible intervention can then be recommended. As Schoepp (n.d.) used a barrier elimination approach to identify all the barriers related to poor technology use in the classroom, this researcher felt that this approach would be beneficial in assisting to analyze the barriers.

Using a survey, as Butler and Sellbom (2002) completed, allowed the staff to voice their perceptions of both their technology proficiency as well as their barriers to using technology in the classroom or in support functions like grading or presentation. The purpose of analyzing these areas was to assist in further understanding the barriers for using technology.

Technology Barriers

Technology is central to business and day to day operations of any organization.

(Bingimlas, 2009) According to Bingimlas, “several studies argue that the use of new technologies in the classroom is essential for providing opportunities for students to learn to operate in an information age” (p. 236). Bingimlas continues to classify reasons for the lack of computer or technology implementation into two classifications: 1) teacher-level barriers, and 2) school-level barriers. The teacher-level level barriers are: lack of teacher confidence, lack of teacher competence, and resistance to change and negative attitudes. The school-level barriers are: lack of time, lack of effective training, lack of accessibility, and lack of technical support.

(Bingimlas, 2009) A limitation of this study was that it did not explore additional barriers that Bingimlas mentioned such as: lack of classroom management skills, poor administrative support (administration-driven barrier), poor school funding, and poor fit with the curriculum.

(Bingimlas, 2009) These additional barriers are noteworthy and should be explored further.

This classification system seemed to address similar reasons in other studies addressing barriers. Park discussed the range of barriers’ studies and the result was similar to that of Bingimlas. Park used factors like: knowledge and skills, capacity, motivation, environment and tools, expectations and feedback, and rewards and incentives. (Park, n.d.) The survey approach was used to examine what barriers were perceived by teachers and interviews were conducted with several school officials.

Schoepp (n.d.) had a different approach to examining the barriers to implementing technology. This approach was examining the barriers at three levels and then determining how to eliminate those barriers. Schoepp (n.d.) examined the common barriers, barriers always present, and barrier elimination. He asked 69 staff members a four part questionnaire using the

Likert scale and the top barrier was that the staff was unsure as to how to effectively integrate technology. The survey had some valuable questions and insight into the possible barriers that may be encountered into this scenario. The questionnaire was divided into six components covering the survey questions from the technology support and training, administration support, reliability of technology, time and money, beliefs around technology and learning, and teacher training. This study was interesting in the scope because it discussed a variety of barriers to using technology including the generalities from the previous studies, however, this study was directed towards the teacher whereas the previous studies was looking at the problem as a whole and in cases, included the teacher as a barrier to implementation. (Schoepp, n.d.)

In *Barriers to Adopting Technology for Teaching and Learning* (Butler & Sellborn, 2002), barriers to adopting education were evaluated and methods of reducing or eliminating these barriers were addressed. This study was very comprehensive and informative. The structure of the study involved faculty surveys and questionnaires. Butler and Sellborn constructed an elaborate study detailing barriers and corrective measures to redress many of the problems. (Butler & Sellborn, 2002) This was one of the most comprehensive studies on this topic. Butler and Sellborn divided the study into several areas with three main areas of concern: proficiency with technology, barriers to adoption, and reliability (or rather, lack of) of the technology. (Butler & Sellborn, 2002) These researchers included dated technology like VCR's and projectors along with reviewing newer technology like smart boards and education software/data management systems. The study reviewed the faculty member's proficiency in technology and included recommendations for improving technology proficiency as well as other barriers listed within the study (Butler & Sellborn, 2002).

Technology Benefits

The Digital Divide (Hudson, 2011), explores how students defined as the “haves” and the “have-nots” are faring with or without the use of technology. According to Hudson (2011), technology is used as a method of research in the classroom as compared to how one student uses technology at home. Based on Megan’s experiences, this article states, “most of the classrooms in Megan’s school don’t have their own workstations, so teachers have to sign up for time at the computer lab. And while a few teachers have interactive whiteboards, Megan has never had the opportunity to use one. Overall, Megan says that she ‘definitely’ uses more technology at home than she does at school” (Hudson, p. 46). This provokes the question about the purpose of schooling as well as preparing our children to use technology in the workplace and “is our educational system failing in this aspect?”

Gutek (2004) expresses the importance of using effective instruction for children. Encouraging students to participate in hands-on activities where they are able to become a stakeholder in their learning will increase student motivation. Gutek mentions “Children learn science best when they are able to do experiments, so they can witness *science in action*.” (p. 259). This researcher believes that technology should be included in this statement.

Technology increases student motivation. According to Gunning (2003), technology increases student motivation. Gunning says, “audio and audiovisual technologies can be used to motivate children to read or to expand children’s understanding and appreciation of a selection.” (p. 575). This increased student motivation may lead to improved test scores and overall student achievement.

Analysis and Description of Conceptual Holes

The studies found by this researcher uncovered a wealth of studies and articles discussing the use or lack of use in education. In the body of research studied, this researcher did not locate current studies that singled out the lack of technology or resources at charter public schools versus traditional public schools. Without the support of a local district, like traditional public schools, it is possible that charter public schools do not have the support in technology that other schools may benefit.

One problem during this study was that the survey seemed to confuse some staff members and they asked several questions during the survey which may have influenced staff to change or alter answers so it would reflect a “common” view rather than their own perception. One way to resolve this issue is to have provided a sample question where an explanation of the survey was provided.

Summary

The studies reflect that the use of technology is very beneficial for students both inside and outside of the classroom. According to the literature, there are two types of barriers: teacher-driven and school-driven. Learning about the barrier type assists the researcher in finding a solution or making a recommendation to resolve the issue. In the next chapter, the design of study incorporates the two types of barriers and provides the foundation of this study.

Chapter Three

Research Design

This study was designed to understand the technology barriers at one site in Southern California. This site was selected due to the researcher's familiarity to the site. The researcher was aware of an ongoing challenge that faculty have addressed and discussed on several occasions and attempts to answer the question: "What are the barriers to implementing technology in the classroom?"

Action Research Plan

The literature review revealed that there was a need to improve circumstances for educators in utilizing technology in their curriculum. The barriers were divided into two types: teacher-driven and school-driven. By understanding the barriers, the researcher was able to make feasible recommendations that would permit a suitable solution for implementing technology successfully into the classroom.

Site

The site is one charter public school located in Southern California. The school serves K – 12 grade students with middle class backgrounds who are primarily Caucasian. The student body was diverse in learning modalities and many were designated as having a learning disability. This school is a parent choice school and parents opt to send their children to this school over their local traditional public school.

Participants

The participants in the study were all staff and faculty located at the site. This included:

- 1) part time k-12 teachers, 2) full time k-12 teachers, 3) onsite administrators, and 4) faculty who

have direct contact with students. The survey was completely anonymous so there was no way of knowing who completed the survey and who didn't.

Data Gathering Methods and Procedures

The research design included: 1) faculty survey, 2) participant observation, and 3) inventory of equipment. These methods were used to further understand the barriers for using technology in the classroom.

The rationale for using these methods was based upon the studies by Butler and Sellborn (2002), Park (n.d.), and Bingimlas (2009). These researchers used observation and survey in their studies with in some cases exclusively survey approach as seen with Schoepp (n.d.).

Instruments

- Survey
 - Survey approach used in the following studies: Bingimlas (2009), Park (n.d.), Butler and Sellbom (2002) and Schoepp (n.d.).
 - The key areas of the survey were: staff proficiency in technology, staff perception of barriers, and staff perception of factors effecting adoption of technology.
 - The survey questions were formatted as a phrase with the Likert scale available for staff to circle a number 1 (Strongly Disagree – not a barrier) through 5 (Strongly Agree – a major barrier). See Appendix for the complete study.
 - Example: I proficiently use presentation software. 1 2 3 4 5
 - Survey took approximately 15 minutes to answer.
 - Survey was conducted at the final staff meeting of the year in May, 2012.
 - Data collected scores on the survey using the Likert scale.
- Observation

- Observation method was used in the following studies: Park (n.d.), Patter (2009), and Bingimlas (2009).
- Key observations focused on how much technology was being used in the classroom and how available was the technology.
- Observation was conducted during a teacher presentation and informally throughout the year.
- Administration of the observation was informal observation throughout the year.
- Data received was in the form of narrative.
- Teacher's journal/ Field Notes
 - Field notes were used in the following studies: Bingimlas (2009), and Patter (2009).
 - This researcher used this method to understand how technology was being used or not used during the course of any given day of instruction.
 - Researcher was present on site every day of the school year for the year August 2011 to June 2012.
 - The data recorded was narrative style text based on observation throughout the school year.

The first step in understanding the barriers was to provide a survey to the staff to better understand the staff's perceptions of the barriers. The survey was designed to cover three areas: 1) Staff Proficiency with Technology, 2) Technology Problems Reported by Faculty, and 3) Factors Affecting the Adoption of Technology. The survey included questions the faculty would score using the Likert Scale as well as an open-ended response section. This survey was

designed to understand the level of understanding the faculty possessed in technology as a self-measured, unanimous survey. This survey is located in the appendices of this paper.

The survey was provided to faculty at the end of the year and served as an end of year evaluative piece to understand the challenges with technology at this site.

Further analysis in daily interactions with staff or other members of the staff and parents of students' uncovered further understanding of the issues involved with the use of technology at the school site. Participant observation was central in the data collection of this issue.

Observation notes were taken by the researcher throughout the past year and recorded.

An equipment inventory was taken to understand the quantity of technology on the site and to compare the quantity to the number of students served. The technology inventory included: 1) laptops and desktop computers, 2) media equipment, 3) overhead projects or ELMOs, 4) educational software or resources available to students, and 5) other equipment as mentioned by staff. The focus of this inventory was to learn about the equipment available to staff by the school site.

Purposes as related to the study's question	Data Gathering Method	Data Sources	Timing	Type of Data Collected	Key Questions, Concepts, and Observation
To determine staff's perception of technology needs	1. Survey 2. Observation	Staff	1. Once, end of year 2. Continuous	Staff's perception of technology use	How can staff's perception of technology barriers assist in improving technology culture at this site?
To determine staff's self measured proficiency level using technology	Survey	Staff	Once, end of year	Staff's perception of their technology literacy	Is staff proficiency in technology perceived as a barrier by staff?
To understand what technology is available on site for use by staff	1. Inventory 2. Observation/Survey	1. Site Staff 2. Staff	1. Once 2. Continuous, once	Accessibility of technology on site to staff	Is technology available to staff? How reliable is the technology?

Ethical Considerations

The ethical considerations of this study were to take into careful consideration this issue without placing blame on any one group. This study was designed to better understand the problem rather than to place blame for the problem. Each group (teachers, administrators, and students) had a stake in this issue and better understanding the issue was central to finding a solution. Since this study focused on uncovering issues to a current problem, there was very little ethical risk to any of the participants. This study provided a snapshot of the use of technology and the resources available at a given site, at a particular period of time. For this reason, this study was able to be conducted without IRB consultation.

Data collection was isolated to information received during the 2011 – 2012 academic school year. This is a snapshot of the available technology in this academic year. It is unknown what technology plans this site has for the future.

Summary

This study was conducted to understand the barriers to technology that are experienced by staff at this school site. In understanding the barriers, this researcher is better prepared to provide possible solutions to this growing issue experienced at this site. During this study, staff made their feelings very clear through both survey as well as observation in day to day functions.

Chapter Four

Understanding the Data

The study uncovered the technology resources and use at one site in Southern California. The purpose was to understand the barriers teachers and other staff experience when incorporating technology into the curriculum as well as in instructional support.

Findings

The findings of the staff survey (35 surveys completed) showed a majority of the staff perceived themselves to be proficient in several technologies listed in the survey. Figure one displays the survey results for staff proficiencies on several technologies, Section I of the survey. Using the Likert scale, staff members were asked about their perceived proficiency in a variety of technologies. (Appendix A) The staff perceived their abilities in most areas as proficient with the exception of using FTP (question 8), ELMO projectors (question 9), statistical software (question 10), web file managers (question 11), FrontPage (question 12), Scantron software (question 19), and Oasis (question 20).

An interesting finding was that the staff was unclear on how to effectively use two technologies that the school provides: Scantron software and Oasis. This is an area that staff would benefit from receiving additional support. Questions 8 – 12 are technologies that teaching staff may benefit from receiving training on providing that they are given these resources to use.

Question 18 asked staff if they felt proficient with a school provided online software program called Moodle. Twenty-two members of the total thirty-five members of the staff answered that they felt proficient using Moodle.

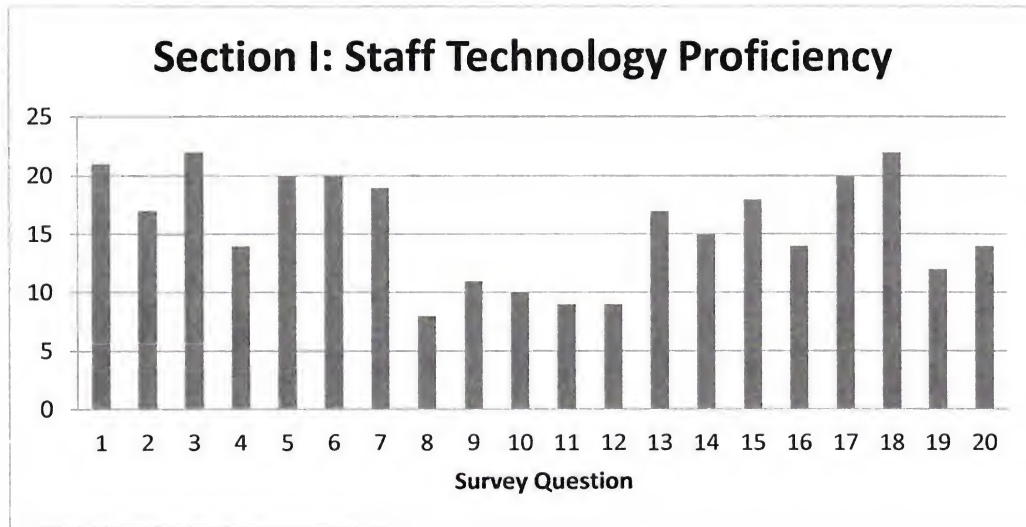


Figure 1: Frequency of responses by staff about their proficiency in technology. The question on the survey was framed "I proficiently use..." then using the Likert scale the staff member would select their answer for the following questions: 1) Presentation Software, 2) Graphics Software, 3) Internet Browser, 4) Spreadsheet Software, 5) PC, 6) Email, 7) Word Processing Software, 8) FTP, 9) ELMO Projectors, 10) Statistical Software, 11) Web File Managers, 12) Frontpage, 13) Overhead Projectors, 14) MacIntosh Computers, 15) Jupiter Grades, 16) Whiteboard, 17) VCR/DVD, 18) Moodle, 19) Scantron Software, and 20) Oasis.

Section II of the survey discussed all the possible problems reported by faculty. Reported as a major barrier was question 1 (equipment malfunction or failure) and question 11 (internet too slow/ internet issues). This supports many of the observations throughout the study.

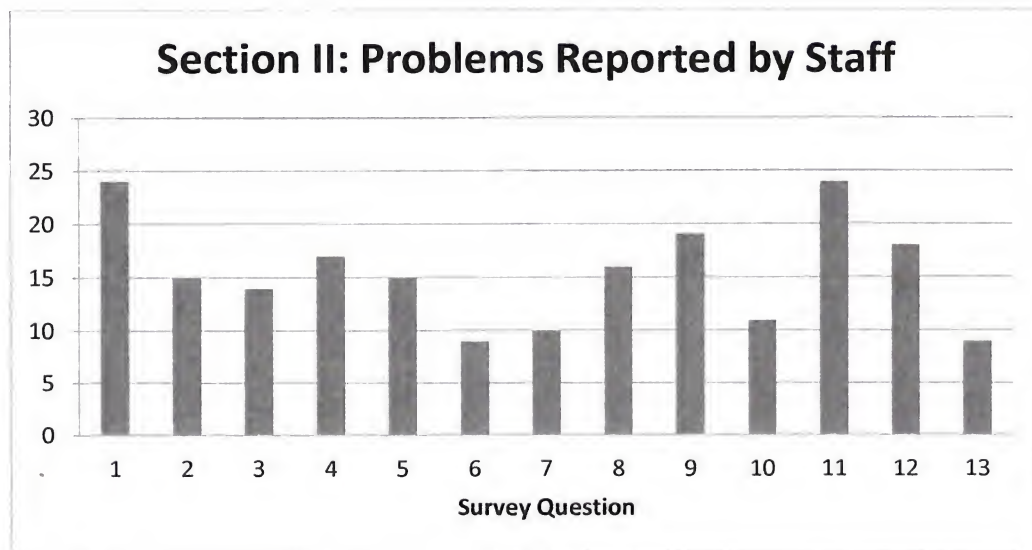


Figure 2: Frequency of response by staff about problems reported about technology. On a Likert scale, the following items were listed: 1) Equipment failure or malfunction, 2) Time to learn new technology, 3) Carts too hard to use; don't like carts, 4) Equipment too different across classrooms, 5) Campus support weak, 6) Software out of date, 7) Takes too long to learn given value to learning, 8) Software incompatible with classroom/office/students' systems, 9) Difficult to schedule arranging use of technology, 10) Nowhere to learn; need to learn, 11) Domain too slow/ internet issues, 12) Software malfunction, and 13) Light bulb burned out.

Section II also included an open-ended response area. The list of comments included in the survey showed that staff was aware of the lack of resources at this site and would like to have more access to technology resources.

The results of this section are listed below:

Lack of any technology at school site	Internet often is not working or slow
Access to projector & computers limited	Access to ELMO and other technologies
Need current presentation systems!!!	No budget dedicated to technology
Support staff is heavily burdened with other responsibilities, it often takes too long to solve these issues or they are overlooked/forgotten	I need a computer in my classroom!
Access to LCD projector	The biggest barrier is having enough student computers that all work at the same time

Section III included factors that affect each staff member in using technology. Questions 1, 4, and 5 were marked as significant barriers to using technology. Question 1 was the reliability of technology. Twenty respondents out of the thirty-five answered question 1 as being a major barrier. This reliability of technology being accessible and working was a huge barrier found at this school site. Question 4 was the institutional support for using the technology now. Fifteen respondents out of the thirty-five answered question four as being a major barrier. Question 5 was the institutional support for using the technology now. Fifteen respondents out of the thirty-five answered question 5 as being a major barrier. Overall question 1, reliability of technology, was cited as being the most perceived barrier to successful use of technology on the campus.

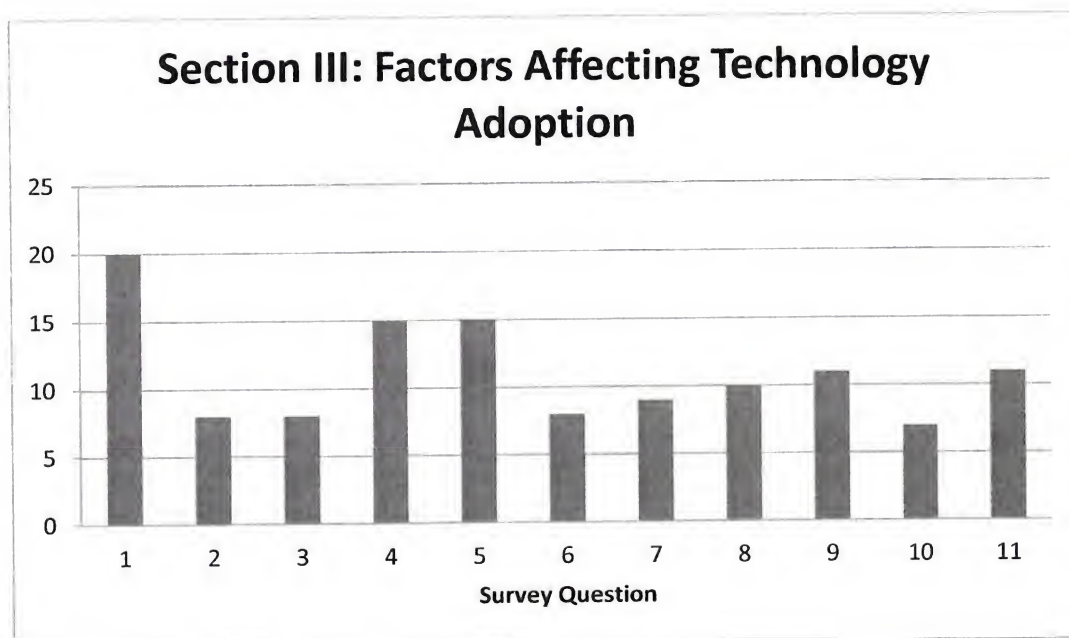


Figure 3: Frequency of responses by staff indicating barriers in adopting technology. On a Likert scale, the following items were listed: 1) Reliability of the technology, 2) Knowledge of how to use the technology, 3) Believe the technology improve or enhances learning, 4) Institutional support for using the technology now, 5) Institutional support for using the technology in the future, 6) Difficulty in learning to use the technology, 7) I have use the technology often in the past, 8) The technology helps me with thinking and planning, 9) I expect the technology to save me time in the long run, 10) Unique or innovative technology, and 11) Others in my grade level or program are using the technology.

Observations

In addition to the survey administered, participant observation disclosed very similar issues with technology use at this campus and supported the findings from the data in the survey.

During a major testing event, the classroom of 24 students had to rotate laptops for testing because they were either not working or there were not enough laptops for each student. This teacher had taken into account for missing or broken laptops and had borrowed two computer carts for this occasion. This is not unlike what other teachers did during this testing period as well. Other teachers complained about the same issue during testing as well as not being able to connect to the internet.

Discourse with the site administration uncovered challenges with technology that staff had not previously disclosed. Administration expressed their frustrations with missing and/or

broken equipment declaring that teachers were not adequately supervising the use of the laptops. Laptops were being returned with broken keys and missing batteries. This was making it difficult for the next teacher to use. At one point, they requested the technology teacher to maintain check out records with each staff, but apparently there was little follow through and inventory continued to be unchecked. Some staff would keep laptops past daily checkout times, therefore, making it much more difficult for others to rely upon the use of a classroom set of laptops when needed.

Other issues were reported by administration, stating that students had hacked into the laptops main operating system and had replaced the approved screensavers with pornography and other unacceptable images. This inappropriate use of technology was difficult to control even with safety filters in place.

Equipment Inventory

The inventory of technology at the school site included a variety of resources: laptops, TV/VCR/DVD systems, LCD projector, overhead projectors, and software programs. However, for the size of the school site, the equipment was very minimal. This site serves over 700 K-12 students. In comparison, classroom teachers at neighboring school site have access to an overhead projector for daily use in their classrooms as well as a few computers for students' use. This school site lacked many of the other resources that teachers would typically find at other sites.

The following is an inventory list of the hardware and software found at this school site. Included is a short description of each item as well as an issue addressed regarding that item.

Inventory of Equipment

3 Laptop Elementary Computer Carts*	Containing 30 slots (many laptops were missing or broken)
2 Laptop Middle School/ High School Computer Carts*	Containing 30 slots (many laptops were missing or broken)
2 Overhead Projectors*	Found in classrooms that used them daily
3 TV carts with VCR or DVD	Available for checkout by site facilitator
2 LCD Projectors*	Non-working, awaiting final steps in installation from prior year – one was used in a presentation in the multipurpose room at the end of the school year.
3 Copy machines/ printers*	Available to staff to copy, print (a copy limit was placed this equipment at the end of the year)
43 Desktop computers*	Staff desktop computers that have internet access and printing capability
6 Wireless Internet hubs*	Aligns staff and students with internet access through wireless hubs

Software available to students

Aleks	Math online program for students to practice (available to 5 th grade through 12 th grade)
XtraMath	Math online program for students to practice math concepts (available to k-12 by relies on teacher to register class)
Moodle*	Online Tool used by teachers to communicate classroom content with parents and students
Juniper Grades / Snap Grades*	Online tool used by teachers to communicate grades and assignments with parents and students

*These starred items were mentioned in the staff survey; see that section for clarification.

Discussion

The major findings of this study show a school where staff is proficient in technology use, but desires the equipment to integrate into the classroom. This is unlike what Bingimlas (2009) wrote about teachers not having the proficiency to implement technology in the classroom. The barrier of available technology for teacher use is something that Butler and Sellbom (2002) asserted that available technology may not be critical in the learning process. This site may not value technology as being a critical component for learning. With the current

economic crisis in education, this site is not likely to begin implementing more technology or newer technologies.

As Butler and Sellbom (2002) mentioned that broken or malfunctioning technology was of a major concern, this study revealed a similar concern. The campus shared equipment between grade levels and programs. It was not uncommon to find computers malfunctioning. This is an area that would benefit from a program review. The possible solution to this problem is to start a technology club where the technology expert on campus trains high schools to properly maintain computers and create a check out system. This additional support function would benefit both students as well as staff. Lack of technical support was mentioned in Bingimlas (2009) as one of the top barriers to using technology.

The survey uncovered an issue with training on school related software and hardware. This was an issue mentioned by Bingimlas (2009), Park (n.d.), Butler and Sellbom (2002), and Schoepp (n.d.). These studies discussed the importance of creating a mentoring or coaching system where teachers can receive support for using technology in the classroom.

The issues revealed through survey at this site can be resolved with creative planning and the appropriate amount of facilitation.

Limitations

This study was a snapshot in time of the technology at one school site in Southern California. This study was not attempting to apply this information from one site to all school sites in Southern California. For this reason, this study provided an evaluative measure to seek solutions for this type of an issue. This study was produced to unveil the perceptions of staff regarding technology use and technology availability to staff.

Chapter Five

Summary and Conclusion

Technology is only as good as the accessibility and ease of its use. If teachers are having difficulty using the technology, there is a good chance that students will also experience this difficulty. Understanding the barriers to using technology effectively in the classroom is the first step in finding solutions to cure this issue. The benefits of using technology in the classroom are very clear in both student achievement as well as improving student motivation. (Gunning, 2003)

Conclusions

There were three major barriers that the data supported. The major barriers to using technology for the study site were:

- 1) Accessibility to Technology (Internet and Equipment)
- 2) Equipment Condition (Broken or not Functioning)
- 3) Appropriately Trained Staff to Use Technology Offered (Scantron, Oasis, & Moodle)

These barriers emerged through study of data from the survey as well as participant observation. The site administration further acknowledged these barriers during a discussion regarding issues with technology at the school site. Clearly, this school site requires an intervention to solve their technology woes. The staff was frustrated by the lack of resources and the administration suffered from the economic loss due to damaged or lost equipment. All the while, as the tension ensues, the students suffer.

Implications for Practice

With budget constraints, keeping technology available and current is a challenge. This school site is in need of a major intervention to assist in repairing the technology they currently possess and assessing the staff needs to provide at minimal a substantive learning environment that embraces technology.

As a leader, this researcher would develop a technology committee to oversee the technology on the campus to ensure that all staff receives a baseline of technology. In addition, the development of a student run technology maintenance club would provide high school students with a chance to learn new skills and take a stake in the technology development at their school site. In addition, this may reduce the number of computer malfunctions due to vandalism or theft.

The technology committee would also support grant writing for new technology as well as making community partnerships that may donate or provide technology to this site.

Implications for Further Research

The next steps for research would occur after the implementation of the technology committee. The research would focus on the same survey questions as seen in this study so that this researcher may understand if this intervention improved the conditions for technology at this school site. The implementation of the student would begin in the school year 2012 to 2013 to understand how the implementation of this new program benefits the site and the goals of this study.

Sharing the Results of the Project

The project results were provided to the site administrator as well as an administrative support assistant. The administrator provided very little feedback on the results as it seems that

it is not a priority to this person. The site administrator was not surprised by the results as this person has heard from staff about this issue for some time. This issue is ongoing and the site administrator is considering the issue and developing her own solutions.

On Reflection

As a leader in education, this project has afforded me with a chance to review situations occurring on the school site and understand the complexities of learning about staff issues. The staff is very passionate about this issue and their frustrations were apparent during the staff meeting where the survey was taken. The complexity of having a problem that is unable to be readily resolved was frustrating to both administration and the staff. This topic proved to be a very sensitive issue to bring up. This experience gave me firsthand knowledge in handling a difficult issue in a group forum.

In this future, I would provide the survey through the internet for staff to take privately. The fact the survey was completed with other staff changed the group dynamics and possibly altering the results of the survey.

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Appendices

Appendix A

Survey

Section I – Measuring Staff Proficiency in technology use (Self Measured by Survey)

Please answer the following questions using the Likert Scale: (Circle One)

1- Strongly Disagree – not a barrier, 2- disagree, 3 – undecided, 4- Agree, 5- Strongly Agree – a major barrier.

Answer the following questions using the above scale:

1. I proficiently use presentation software.	1	2	3	4	5
2. I proficiently use graphics software.	1	2	3	4	5
3. I proficiently use an internet browser.	1	2	3	4	5
4. I proficiently use spreadsheet software.	1	2	3	4	5
5. I proficiently use a PC.	1	2	3	4	5
6. I proficiently use Email.	1	2	3	4	5
7. I proficiently use word processing software.	1	2	3	4	5
8. I proficiently use FTP.	1	2	3	4	5
9. I proficiently use Elmo projectors.	1	2	3	4	5
10. I proficiently use statistical software.	1	2	3	4	5
11. I proficiently use web file managers.	1	2	3	4	5
12. I proficiently use Frontpage.	1	2	3	4	5
13. I proficiently use Overhead Projector.	1	2	3	4	5
14. I proficiently use MacIntosh Computers.	1	2	3	4	5
15. I proficiently use Jupiter Grades.	1	2	3	4	5
16. I proficiently use Whiteboard.	1	2	3	4	5
17. I proficiently use VCR/ DVD.	1	2	3	4	5
18. I proficiently use Moodle.	1	2	3	4	5
19. I proficiently use Scantron Software.	1	2	3	4	5
20. I proficiently use Oasis.	1	2	3	4	5

Open-Ended Response – Write any other barriers you may perceive below:

Section II – Problems Reported by Faculty Members

Please answer the following questions using the Likert Scale:

1- Strongly Disagree – not a barrier, 2- disagree, 3 – undecided, 4- Agree, 5- Strongly Agree – a major barrier.

1. Equipment failure or malfunction.	1	2	3	4	5
2. Time to learn new technology.	1	2	3	4	5
3. Carts too hard to use; don't like carts.	1	2	3	4	5
4. Equipment too different across classrooms.	1	2	3	4	5

5. Campus support weak.	1	2	3	4	5
6. Software out of date.	1	2	3	4	5
7. Takes too long to learn given value to learning.	1	2	3	4	5
8. Software incompatible with classroom/office/students'	1	2	3	4	5
9. Difficult to schedule arranging use of technology.	1	2	3	4	5
10. Nowhere to learn; need to learn .	1	2	3	4	5
11. Domain too slow/ Internet issues.	1	2	3	4	5
12. Software malfunction.	1	2	3	4	5
13. Light bulb burned out.	1	2	3	4	5

Open-Ended Response – Write any other barriers you may perceive below:

Section III – Factors Affecting Adoption of Technology

Please answer the following questions using the Likert Scale: circle one

1- Strongly Disagree – not a barrier, 2- disagree, 3 – undecided, 4- Agree, 5- Strongly Agree – a major barrier.

1. Reliability of the technology.	1	2	3	4	5
2. Knowledge of how to use the technology.	1	2	3	4	5
3. Believe the technology improves or enhances learning.	1	2	3	4	5
4. Institutional support for using the technology now.	1	2	3	4	5
5. Institutional support for using the technology in the fu.	1	2	3	4	5
6. Difficulty in learning to use the technology.	1	2	3	4	5
7. I have used the technology often in the past.	1	2	3	4	5
8. The technology helps me with thinking and planning.	1	2	3	4	5
9. I expect the technology to save me time in the long run.	1	2	3	4	5
10. Unique or innovative technology.	1	2	3	4	5
11. Others in my grade level or program are using the tech	1	2	3	4	5

Open-Ended Response – Write any other barriers you may perceive below:

Section IV – Suggested Solutions to Problems – Open ended question.

Please answer this open ended question in the box below. Write any reasonable solutions to any of the barriers you see in the box below.

Appendix B**Inventory of Equipment**

3 Laptop Elementary Computer Carts	Containing 30 slots (many laptops were missing or broken)
2 Laptop Middle School/ High School Computer Carts	Containing 30 slots (many laptops were missing or broken)
2 Overhead Projectors	Found in classrooms that used them daily
3 TV carts with VCR or DVD	Available for checkout by site facilitator
2 LCD Projectors	Non-working, awaiting final steps in installation from prior year
3 Copy machines/ printers	Available to staff to copy, print (a copy limit was placed this equipment at the end of the year)
43 Desktop computers	Staff desktop computers that have internet access and printing capability
6 Wireless Internet hubs	Aligns staff and students with internet access through wireless hubs

Software available to students

Aleks	Math online program for students to practice (available to 5 th grade through 12 th grade)
XtraMath	Math online program for students to practice math concepts (available to k-12 by relies on teacher to register class)
Moodle	Online Tool used by teachers to communicate classroom content with parents and students
Juniper Grades / Snap Grades	Online tool used by teachers to communicate grades and assignments with parents and students

Appendix C

Site Permission Letter



REQUEST FOR PERMISSION TO CONDUCT RESEARCH FORM

INFORMATION ABOUT: Barriers to using technology in the classroom

RESPONSIBLE INVESTIGATOR: April Brown, 714-931-4786

Under the direction of Dr. Nilsen in the School of Education at National University, the investigator(s) is conducting a research study and is inviting you to participate in it.

The purpose of this form is to provide information that may affect your decision about whether or not you will provide permission to conduct this research project at your site. If you choose to approve this research, please sign in the space at the end of this form to record your consent.

Research Project Information

- | | |
|---|--|
| <input type="checkbox"/> Undergraduate Course Requirement | <input type="checkbox"/> Graduate Course Requirement |
| <input checked="" type="checkbox"/> Master's Level Thesis | <input type="checkbox"/> Doctoral Dissertation |

Research Question(s): What are the barriers to using technology in the classroom?

Desired Start Date: ASAP

Duration: 3 weeks

Participants (indicate all that apply):

- ☒ Sample Size
- ☐ Needed Grade Level(s) Requested School(s)/Site(s) Requested Time Required
- ☐ Students
- ☒ Teachers
- ☒ Administrators
- ☒ Other Staff
- ☐ Parents
- ☐ Other (specify):

Brief summary of research design, including procedures for data analysis:

Teachers and other staff are provided with a questionnaire that details several areas that may affect their use of technology in the classroom.

Potential Risks:

No known risks.

Potential Benefits:

None

Instruments to be used:

Questionnaire

Additional Information:

WILL IT COST ANYTHING TO PARTICIPATE IN THE STUDY? WILL I GET PAID TO PARTICIPATE?

None

WHAT HAPPENS IF THE RESEARCHER GETS NEW INFORMATION DURING THE STUDY?

The researcher will contact all participants and site if the researcher learns new information that could change the decision about participating in this study.

**HOW WILL THE RESEARCHER PROTECT PARTICIPANTS' CONFIDENTIALITY?**

The results of the research study will be published, but names or identities will not be revealed.

WHAT HAPPENS IF A PARTICIPANT DOESN'T WANT TO CONTINUE IN THE STUDY?

Participation in this study is voluntary. If individuals choose not to participate or if you choose to terminate the study, this may be done at any time. There will be no penalty.

WILL PARTICIPANTS BE COMPENSATED FOR ILLNESS OR INJURY?

You are not waiving any of your legal rights if you agree to participate in this study. But no funds have been set aside to compensate you or participants in the event of injury. If anyone suffers harm because of participation in this research project, please contact the Office of the Institutional Review Board, National University, 11255 North Torrey Pines Road, La Jolla, CA 92037; Telephone (858) 642-8136.

VOLUNTARY CONSENT

By signing this form, you are saying (1) that you have read this form or have had it read to you and (2) that you understand this form, the research study, and its risks and benefits. The researcher will be happy to answer any questions you have about the research. If you have any questions, please feel free to contact (*principal investigator*) at (*phone number*).

If at any time you feel pressured to participate or if you have any questions about your rights or this form, please call the Office of the Institutional Review Board at (858) 642-8136.

Note: By signing below, you are telling the researcher "Yes" you want to participate in this study. Please keep one copy of this form for your records.

Your Name (please print): Katherine Pangle

Your Signature: *Katherine Pangle*

Title: Director

Date: 04/01/2012

INVESTIGATOR'S STATEMENT

I certify that this form includes all information concerning the study relevant to the protection of the rights of the participants, including the nature and purpose of this research, benefits, risks, costs, and any experimental procedures.

I have described the rights and protections afforded to human research participants and have done nothing to pressure, coerce, or falsely entice this person to participate. I am available to answer the participant's questions and have encouraged him or her to ask additional questions at any time during the course of the study.

Investigator's Signature:

Investigator's Name:

April Brown
April Brown, M.Ed.

Date: April 1, 2012